CMa10w, CMa11w User's Manual

CMa10w, CMa11w

The CMa10w/CMa11w is a Wireless M-Bus temperature and humidity sensor for indoor use.

CMa10w/CMa11w complies with the OMS standard and operates in Wireless M-Bus mode T1. CMa10w/CMa11w is the perfect choice when wiring is not an option.

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1 Document notes

All information in this manual, including product data, diagrams, charts, etc. represents information on products at the time of publication, and is subject to change without prior notice due to product improvements or other reasons. It is therefore recommended that customers contact Elvaco AB for the latest product information before purchasing a CMa10w/CMa11w product.

The documentation and product are provided on an “as is” basis only and may contain deficiencies or inadequacies. Elvaco AB takes no responsibility for damages, liabilities or other losses by using this product.

1.1 Copyright and trademark

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2 Using this manual

2.1 Purpose and audience

This manual covers information needed to mount, configure and use the CMa10w/CMa11w Wireless M-Bus indoor temperature and humidity sensor. It is intended for field engineers and developers.

2.2 Models

CMa10w, CMa11w

2.3 Additional and updated information

Latest documentation version is available on Elvaco web site at http://www.elvaco.com.

3 Introduction

3.1 Product configuration

Use the table below to find out the capabilities of your product.

Product name	Comments
CMa10w	Indoor Wireless M-Bus temperature and humidity sensor with display
CMa11w	Indoor Wireless M-Bus temperature and humidity sensor without display

Table 1 Product configuration

3.2 Capabilities

The CMa10w/CMa11w is a 1-way Wireless M-Bus communicating temperature and humidity sensor for indoor use. CMa10w/CMa11w is the ideal product for comfort level billing. The high accuracy sensor and user friendly handling make the CMa10w/CMa11w the perfect choice for tenant owners.

3.3 Applications

The CMa10w/CMa11w should be used in the following scenarios:

- Indoor measurement of temperature and/or humidity
- High accuracy indoor climate logging
- Use instead of CMa10/CMa11 when wiring is not an option

4 Getting Started

This chapter covers the steps required for getting the CMa10w/CMa11w installed and operational. No pre-configuration is needed before using the CMa10w/CMa11w.

4.1 Overview

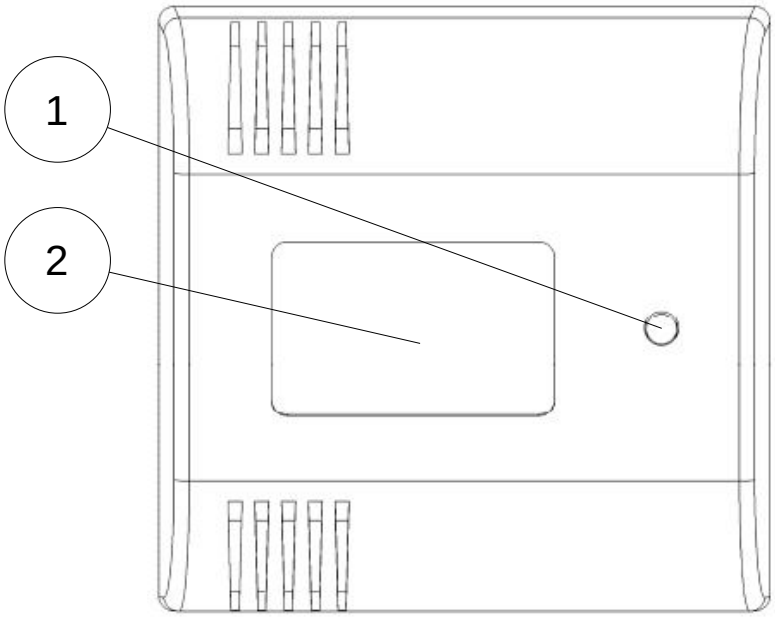


Figure 1 Front view

1. Push-button (SW2) (CMa10w)
2. Display (CMa10w)
3. LED1
4. Push-button (SW1)
5. Serial Number (Identification)

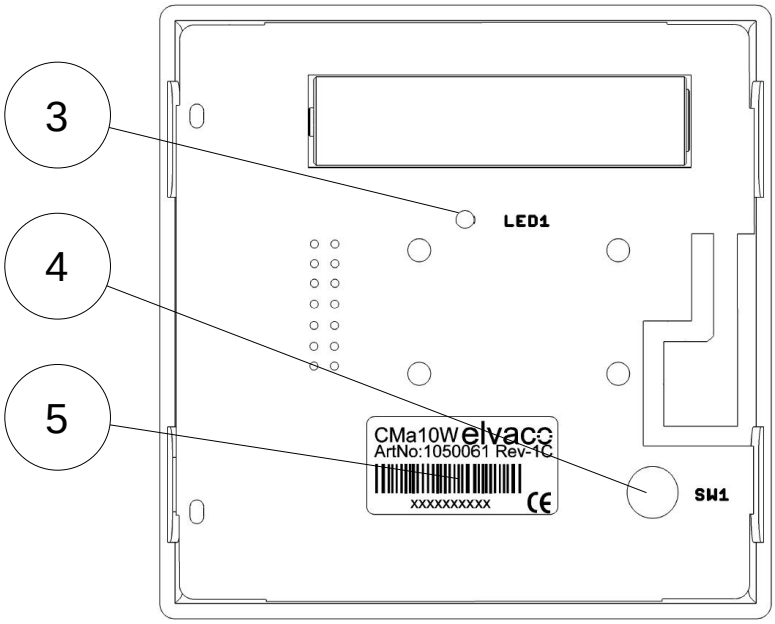
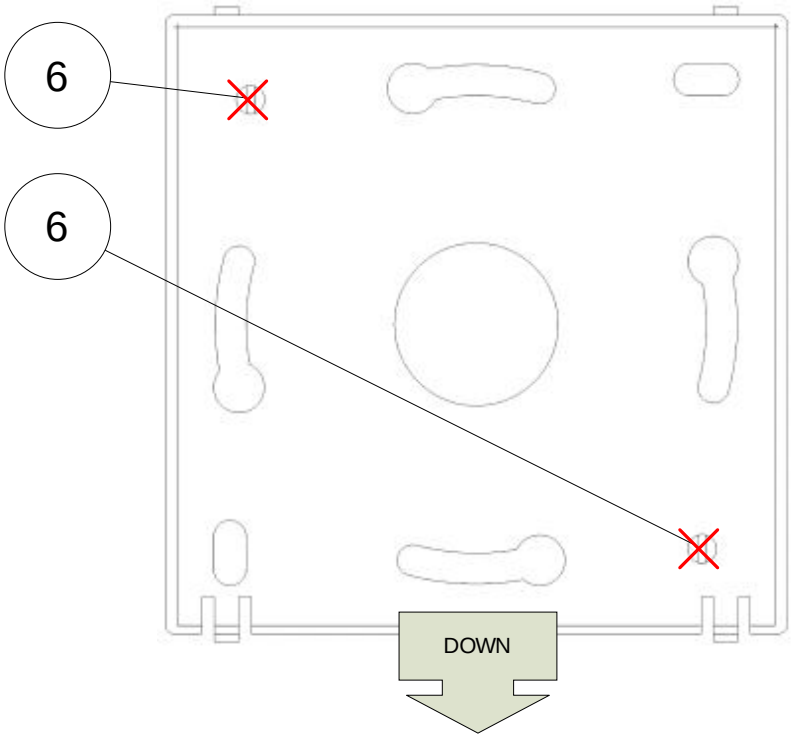


Figure 2 Bottom view (rear cover removed)



6. Do not use for mounting

Figure 3 Rear cover

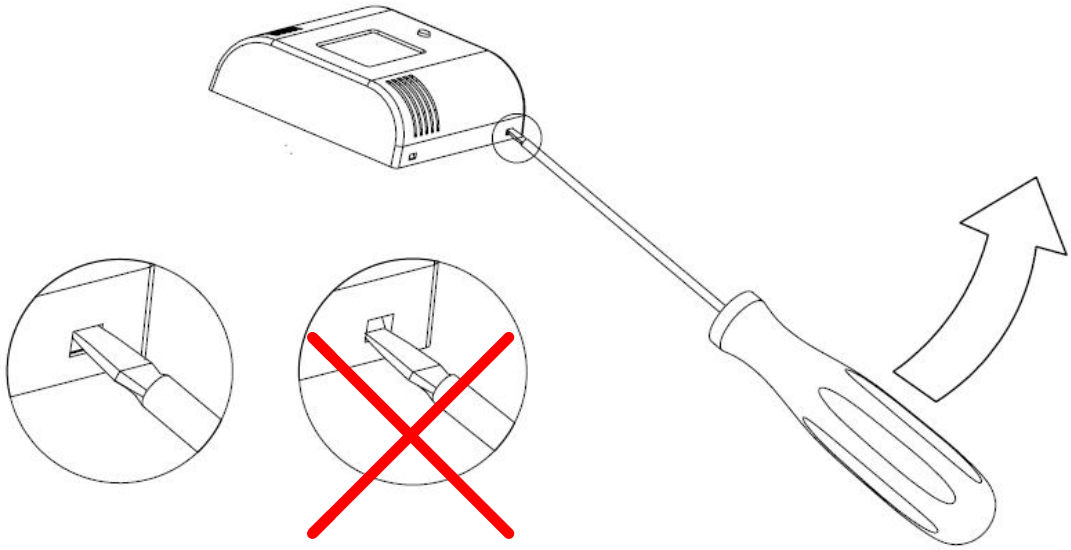


Figure 4 Demounting

4.2 Mounting

When mounting the CMa10w/CMa11w, avoid rooms with a lot of supplementary heat, such as kitchens or south facing rooms. Position the sensor away from direct sunlight. Avoid placing on an external wall or near an external door. Make sure that the sensor is not positioned closer than 1 m from the nearest radiator and at least 1.5 m above the floor.

The CMa10w/CMa11w can be mounted directly on the wall, or over a mounting box. If the CMa10w/CMa11w is placed over a conduit pipe, it is recommended to fill the pipe to prevent air flow which could affect accuracy of the values.

Remove the rear cover to be able to press the installation button SW1 (4).

⚠ **IMPORTANT**

Please take the following in consideration:

- Do not use mounting holes (6) as in Figure 3.
- Turn the rear cover as shown in Figure 3.
- Do not mount the product inside a steel cabinet, which will dramatically lower the possibilities to connect to a collector.

4.3 Wireless M-Bus

The product is delivered with the radio turned off. The radio must be manually switched on during the installation procedure.

The product will not be activated until the installation procedure is started.

4.3.1 Installation procedure

The product can be installed and enabled in two modes:

- **Unencrypted mode**: Data is sent unencrypted and the encryption key is not needed to decrypt the data.
- **Encrypted mode**: Data is sent in encrypted mode and the encryption key is needed to decrypt the data.

Please advise your project manager which operation mode is used in your project.

4.3.1.1 Installation procedure – Select Unencrypted mode

By performing the following steps, the product will start to send spontaneous **unencrypted** data:

1. Press and hold button SW1 (4) for 5 seconds, until LED1 (3) flashes fast. See Table 2 for complete information about LED indication.
2. Release SW1 (4)

The product will now start to send spontaneous unencrypted SND_NR telegrams every 6th minute (default).

4.3.1.2 Installation procedure – Select Encrypted mode

By performing the following steps, the product will start to send spontaneous **encrypted** data:

1. Press and hold button SW1 (4) for 10 seconds, until LED1 (1) flashes slow. See Table 2 for complete information about LED indication.
2. Release SW1 (4)

3. The product will now start to send spontaneous encrypted SND_NR telegrams every 6th minute (default).

⚠ IMPORTANT

Please take the following in consideration:

- After the product is activated, configuration can still be changed on the CMa10w using the Setup menu, see section 5.2.
- The device can be locked for future configuration, see section 5.2.2.7.

5 Application description

This chapter covers general application description and configuration of the product.

5.1 Operation

The product will automatically, after the installation procedure, send T1 messages every 6th minute containing sensor data, such as instantaneous temperature and humidity. The product will also send product status information, containing battery status and other relevant information.

Product configuration can be changed using the Setup menu (CMa10w) as long as the product has not been locked for future configuration, see section 5.2.2.7.

5.1.1 Operation modes

The product has the following operation modes:

1. Inactive (on delivery)
2. Installation procedure (during installation)
3. Normal operation - encrypted mode
4. Normal operation - unencrypted mode

5.1.1.1 Inactive mode

The product is delivered inactive, which means that the product does not perform any tasks before an installation procedure is started. This saves the battery lifetime and ensures that there is no radio activity until the product is manually activated.

5.1.1.2 Installation procedure

The installation procedure is used to activate the product, see 4.3.1.

5.1.1.3 Normal operation – Unencrypted mode

In normal operation unencrypted mode, the product will by default send spontaneous **unencrypted** messages every 6th minute. This can be changed as long as the product has not been locked. This mode is normally used when the collector or AMR/AMM system does not handle AES encryption or if the AES key is unknown to the host system.

5.1.1.4 Normal operation – Encrypted mode

In normal operation encrypted mode, the product will by default send spontaneous **encrypted** messages every 6th minute. This can be changed as long as the product has not been locked. This mode is used to secure data sent from the product to the collector or AMR/AMM system. To be able to decrypt the data, the private 128 bit AES key must be known by the collector or by the host system. The private 128 bit AES key is on demand provided to the customer by Elvaco AB.

5.2 Display (CMa10w)

The display shows current sensor information and is also used to change and view the CMa10w configuration.

The display is in normal operation turned off to save battery. The display is turned on as soon as SW2 (1) is pushed and will be turned off if no button is pressed within 5 seconds.

When the display is turned off, the menu page will be reset to the first page.

Please see Figure 5 for display design.

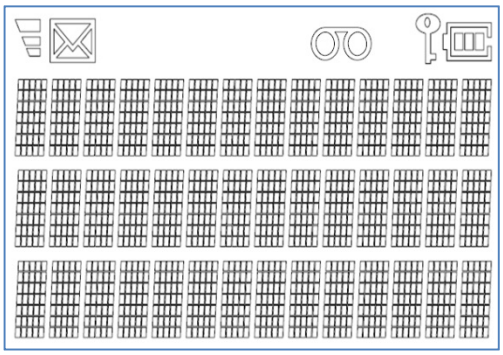


Figure 5 CMa10w display

5.2.1 Display symbols

To easily show current operation and functionality of the product, the display is equipped with display symbols, which indicate Wireless M-Bus mode, encryption and battery level.

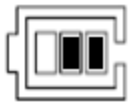
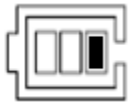
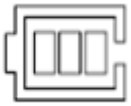
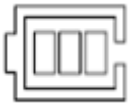
5.2.1.1 Operation mode indicator

This indicator shows if the product runs in encrypted or unencrypted mode. If the indicator is visible, all communication is encrypted, otherwise all communication is sent unencrypted.

Symbol	Description
Steady	Product is encrypting all messages with AES 128 bit encryption. If the product is running in unencrypted mode, the operation mode indicator is hidden.

5.2.1.2 Battery level indicator

The battery level indicator shows current battery level. The product should be exchanged when the battery level indicator is flashing.

Symbol	Description
	Battery has full capacity.
	Battery level is medium.
	Battery level is low.
 Steady	Battery is almost empty.
 Flashing	Battery is empty and the product will stop working within 12 months.

5.2.2 Display menu

Please see Figure 6 for menu options.

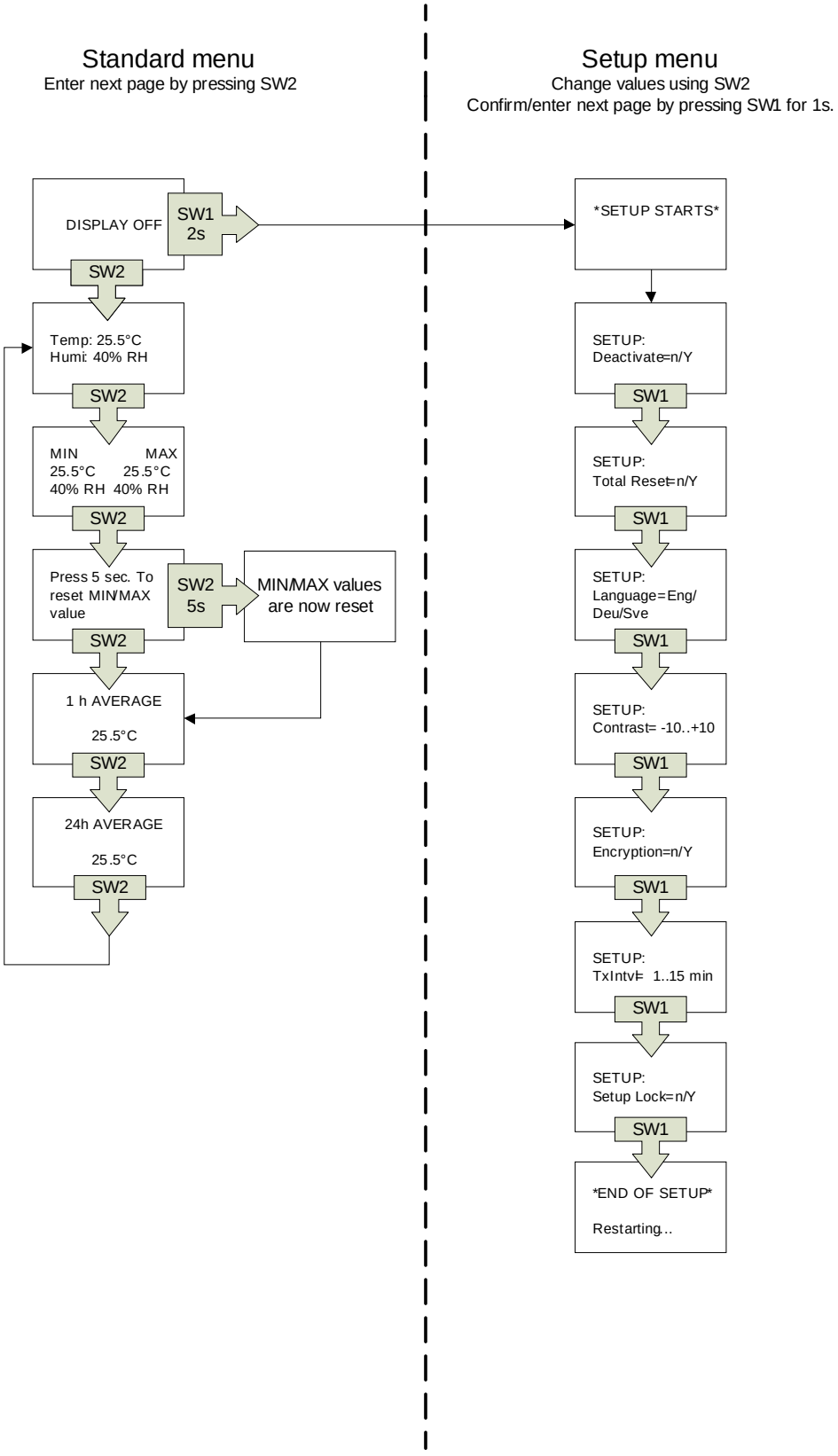


Figure 6 CMa10w Display menu

5.2.2.1 Deactivate the product

Navigate to Setup menu and select “y” in “Deactivate” menu page. This will deactivate the product and the product must be activated with a new installation procedure.

5.2.2.2 Reset to factory default

In order to reset the product configuration to factory default, navigate to “Total Reset” in the setup menu and select “y”.

5.2.2.3 Change language

Navigate to Setup menu and select language (English, Deutsch or Svenska) in the “Language” menu page.

5.2.2.4 Change contrast

Navigate to Setup menu and select contrast from -10 to +10 in “Contrast” menu page. A higher value indicates a higher contrast.

5.2.2.5 Enable/disable encryption

Navigate to Setup menu and select “y” to enable encryption and “n” to disable encryption in the “Encryption” menu page. This has the same functionality as activating the product in encrypted or unencrypted mode.

5.2.2.6 Change transmit interval

Navigate to Setup menu and change interval from 1 minute to 15 minutes in the “TxIntvl” menu page.

5.2.2.7 Lock the product

The product can be locked for future changes. Navigate to Setup menu and select “y” in “Setup Lock” menu page. This will disable the possibility to enter the Setup menu again.

⚠ **IMPORTANT**

Locking the product cannot be undone and any configuration made cannot be changed. If you need to unlock the product, it needs to be sent to Elvaco.

5.3 LED indications

LED1	State/Description	Visual
Permanently off	Off	
Fast flash 50 ms on / 50 ms off	Triggered when button is pressed more than 5 seconds to select unencrypted operation mode. Releasing the button in this state will select unencrypted operation mode.	
Slow flash 250 ms on / 250 ms off	Triggered when button is pressed more than 10 seconds to select encrypted operation mode. Releasing the button in this state will select encrypted operation mode.	

Table 2 LED 1 indications

6 Administration of the product

This chapter covers the configuration and Wireless M-Bus implementation of the product. The Wireless M-Bus slave implementation is according to the new M-Bus standard EN13757-2, EN13757-3, EN13757-4 and the OMS specification.

6.1 M-Bus product identification

The product can be identified by the following information:

- Manufacturer string = ELV
- Medium = 0x1B (Room sensor)
- Generation = 01-09 (CMa10w), 10-19 (CMa11w)

The generation field between product releases will **only** change (increase by 1) if the M-Bus protocol information changes between versions. Use the software version field in the M-Bus telegram to identify current software version.

6.2 Wireless M-Bus mode

The product is using Wireless M-Bus mode T1, which means that the product sends spontaneous data in one direction, from product to collector.

6.3 M-Bus addressing

The address used is a globally unique address, which is set during production.

6.4 Operation mode

The product can operate in encrypted or unencrypted mode. In encrypted mode, OMS encryption mode 5 is used with AES 128 bit key for all telegrams. When running in unencrypted mode, all telegrams will be sent unencrypted

6.5 Spontaneous transmission

The product will automatically start sending spontaneous telegrams with measurement data after the installation procedure is completed. The product sends by default an SND_NR telegram every 6th minute. The transmission interval is configurable in the Setup menu of the CMa10w.

6.6 M-Bus commands

All data in the tables are described unencrypted.

6.6.1 Send spontaneous data (SND_NR)

During normal operation, the Wireless M-Bus command SND_NR is sent by default every 6th minute.

6.6.1.1 Slave to master – Telegram 1 (SND_NR)

Byte index	Data	Description
0	0xnn	L-Field
1	0x44	C-Field: SND_NR

2..3	0x9615	Manufacturer “ELV”
4..7	0xnnnnnnnn	Identification number
8	0xnn	Version field
9	0x1B	Device type (Medium) = Room sensor
10..11	0xnnnn	CRC-field
12	0x7A	CI-Field (Short header)
13	0xnn	Access number
14	0xnn	Status
15..16	0xnnnn	Configuration word
17..18	0x2f2f	AES check (idle filler)
19	0x02	Instantaneous temperature DIF
20	0x65	Instantaneous temperature VIF, external temperature
21..22	0xnnnn	Instantaneous temperature x 100 In case of error the temperature will be set to 0.
23	0x42 | 0x72	1-hour temperature rolling average DIF, storage number 1 0x42 = The value is available 0x72 = The value is not yet calculated
24	0x65	1-hour temperature rolling average VIF, external temperature
25..26	0xnnnn	1-hour temperature rolling average x 100 This value is unavailable (0) until 1 hour has passed since power-on. During this first hour the value will be flagged as “value during error state”, DIF bits 5 and 4 = 1. This value is updated every 6 minute. The temperature data will be 0 in case of sensor error. See slave status byte in data header.
27	0x82 | 0xb2	24-hour temperature rolling average DIF, storage number 2 0x82 = The value is available 0xb2 = The value is not yet calculated
28	0x01	24-hour temperature rolling average DIFE
29	0x65	24-hour temperature rolling average VIF, external temperature
30..31	0xnnnn	24-hour temperature rolling average x 100

		This value is unavailable (0) until 24 hour has passed since power-on. During this period the value will be flagged as “value during error state”, DIF bits 5 and 4 = 1. This value is updated every hour. The temperature data will be 0 in case of sensor error. See slave status byte in data header.
32	0x22	1-hour minimum temperature DIF
33	0x65	1-hour minimum temperature VIF, external temperature
34..35	0xnnnn	1-hour minimum temperature x 100 In case of error the temperature will be set to 0. This is the lowest instantaneous temperature since last 1-hour period.
36	0x12	1-hour maximum temperature DIF
37	0x65	1-hour maximum temperature VIF, external temperature
38..39	0xnnnn	1-hour maximum temperature x 100 In case of error the temperature will be set to 0. This is the highest instantaneous temperature since last 1-hour period.
40	0x62	24-hour minimum temperature DIF
41	0x65	24-hour minimum temperature VIF, external temperature
42..43	0xnnnn	24-hour minimum temperature x 100 In case of error the temperature will be set to 0. This is the lowest instantaneous temperature since last 24-hour period.
44	0x52	24-hour maximum temperature DIF
45	0x65	24-hour maximum temperature VIF, external temperature
46..47	0xnnnn	24-hour maximum temperature x 100 In case of error the temperature will be set to 0.

		This is the highest instantaneous temperature since last 24-hour period.
48	0x02	Instantaneous relative humidity DIF
49	0xfb	Instantaneous relative humidity VIF, extension table FB
50	0x1a	Instantaneous relative humidity VIFE
51..52	0xnnnn	Instantaneous relative humidity x 10 In case of error the relative humidity will be set to 0.
53	0x42 | 0x72	1-hour humidity rolling average DIF, storage number 1 0x42 = The value is available 0x72 = The value is not yet calculated
54	0xfb	1-hour relative humidity VIF, extension table FB
55	0x1a	1-hour relative humidity VIFE
56..57	0xnnnn	1-hour relative humidity x 10 In case of error the relative humidity will be set to 0.
58	0x82 | 0xb2	24-hour humidity rolling average DIF, storage number 2 0x82 = The value is available 0xb2 = The value is not yet calculated
59	0x01	24-hour humidity rolling average DIFE
60	0xfb	24-hour relative humidity VIF, extension table FB
61	0x1a	24-hour relative humidity VIFE
62..63	0xnnnn	24-hour relative humidity x 10 In case of error the relative humidity will be set to 0.
64	0x22	1-hour minimum relative humidity DIF
65	0xfb	1-hour minimum relative humidity VIF, extension table FB
66	0x1a	1-hour minimum relative humidity VIFE
67..68	0xnnnn	1-hour minimum relative humidity x 10 In case of error the relative humidity will be set to 0. This is the lowest instantaneous relative humidity since last 1-hour period.

69	0x12	1-hour maximum relative humidity DIF
70	0xfb	1-hour maximum relative humidity VIF, extension table FB
71	0x1a	1-hour maximum relative humidity VIFE
72..73	0xnnnn	1-hour maximum relative humidity x 10 In case of error the relative humidity will be set to 0. This is the highest instantaneous relative humidity since last 1-hour period.
74	0x62	24-hour minimum relative humidity DIF
75	0xfb	24-hour minimum relative humidity VIF, extension table FB
76	0x1a	24-hour minimum relative humidity VIFE
77..78	0xnnnn	24-hour minimum relative humidity x 10 In case of error the relative humidity will be set to 0. This is the lowest instantaneous relative humidity since last 24-hour period.
79	0x52	24-hour maximum relative humidity DIF
80	0xfb	24-hour maximum relative humidity VIF, extension table FB
81	0x1a	24-hour maximum relative humidity VIFE
82..83	0xnnnn	24-hour maximum relative humidity x 10 In case of error the relative humidity will be set to 0. This is the highest instantaneous relative humidity since last 24-hour period.
84	0x02	Product status DIF
85	0xfd	Product status VIF, extension table FD
86	0x1b	Product status VIFE, digital input
87..88	0xnnnn	16-bit integer value with following bit-mask: Bit15: 24-hour toggle bit Bit14: 10 minute toggle bit Bit13..10: Not used Bit 8..9: Battery level 00b = Empty 01b..11b (1d-3d) = Level 1 to 3 (full) Bit 4..7: Tx interval 0d..15d minutes Bit 3..1: Not used

		Bit 0: Sensor failure - 1 = Sensor failure (same as 0x0a in header status byte) - 0 = No sensor failure
89	0x0d	Firmware version DIF
90	0xfd	Firmware version VIF
91	0x0f	Firmware version VIFE = “Other software version”
92	0x05	Length of firmware string
92..96	0xnnnnnnnnnn	Firmware version string in format: Major.Minor.PatchLevel
97	0x0F	End of telegram, no more data.

7 Troubleshooting

7.1 Collector does not receive any telegram sent from the product

This can be a due the following reasons:

- The product has not been turned on using the installation procedure, see 4.3.1.
- The master is not powered up or not correctly configured.
- The distance to the master is not within range.
- The master antenna is not properly mounted for best performance.
- The position of the product is inside a metallic cabinet or is disturbed by other radio equipment.

7.2 Information not visible on the display

This can be a due the following reasons:

- The product has not been turned on using the installation procedure, see 4.3.1.
- The LCD contrast is set to a low value.
- The battery is empty. Check the serial number label of the product when the product is produced. The lifetime is 12 years.

7.3 Temperature value is inaccurate

The temperature sensor is very accurate, but incorrect positioning of the product may result in unintended temperature variation. Please take the following in consideration when mounting the product:

- Do not mount the product close to heat sources (front and rear)
- Do not mount the product in direct sunlight
- Do not mount the product in the area of a spotlight beam

If the problem persists, please contact Elvaco AB.

8 Technical specifications

8.1 Characteristics

Type	Value	Unit	Comments
Mechanics			
Casing material	ABS UL94-V0	-	White
Protection class	IP20	-	
Dimensions	80 x 80 x 28	mm	
Weight	75	g	
Antenna Wireless M-Bus	Internal	-	
Mounting	Wall mounted		
Electrical			
Power supply	Internal battery		
Lifetime	12	Years	
Environmental			
Operating temperature range	0 to +50 (CMa10w) -20 to +55 (CMa11w)	°C	
Storage temperature range	-40 to +85	°C	
Operating humidity	0 to 95	%RH	No condensation
Temperature sensor			
Temperature range	0 to +50 (CMa10w) -20 to +55 (CMa11w)	°C	
Accuracy +10 to +30 °C	+/- 0.2	°C	
Accuracy 0 to +10 °C	+/- 0.4	°C	
Accuracy -10 to +0 °C	+/- 0.5	°C	
Accuracy -20 to +55 °C	+/- 1.5	°C	
Humidity sensor			
Humidity range	0-100	%RH	
Repeatability RH	+/- 0.1	%RH	
Accuracy 10 to 90 %RH	+/- 2	%RH	
Accuracy 0 to 100 %RH	+/- 4	%RH	
User interface			
LCD display	Yes (CMa10w)	-	Display current temperature, humidity, min/max values and configuration.
Button with LED	Yes	-	Menu navigation

	(CMa10w)		
Green LED	Yes	-	Configuration/Activation
Button	Yes	-	Configuration/Activation
Wireless M-Bus			
M-Bus standard	EN 13757-4	-	OMS compliant, Mode T1
M-Bus commands	SND_NR	-	
Momentary values	Temperature, humidity, status	-	
Historic values	Average values for last hour and last day for temperature and humidity	-	
Transmit power	10	mW	
Sensitivity	-104	dBm	
Frequency	868	MHz	Band

Table 3 Technical specifications

8.2 Factory defaults

Name	Value	Unit	Comments
Language	ENG		English
Transmit interval	6	minutes	Time between SND_NR telegrams in normal operation
Encryption mode	Off		Can be changed during installation mode
LCD contrast	0		
Locked	No		

Table 4 Factory defaults

9 Type approvals

CMa10w/CMa11w is designed to comply with the directives and standards listed below.

Approval	Description
EMC	EN 61000-6-2, EN 61000-6-3

Table 5 Type approvals

10 Safety and environment

10.1 Safety precautions

The following safety precautions must be observed during all phases of the operation, usage, service or repair of any CMa10w/CMa11w product. Users of the product are advised to convey the following safety information to users and operating personnel and to incorporate these guidelines into all manuals supplied with the product. Failure to comply with these precautions violates safety standards of design, manufacture and intended use of the product. Elvaco AB assumes no liability for customer's failure to comply with these precautions.

All instructions must be carefully read before CMa10w/CMa11w is installed and used. They contain important information about how the product is used properly.

The installation of CMa10w/CMa11w should not be started before the technical specifications are fully understood. The work must be performed in the order listed in this manual, and only by qualified personnel. The work must also be done in accordance with national electrical specifications and applicable local regulations.

In order to avoid the product being damaged by static electricity, an ESD wristband should be worn when handling the product.

The labelling of the product may not be changed, removed or made unrecognizable.

11 Document history

Version	Date	Description	Author
1.0	2012-04-19	First release	David Vonasek
1.1	2012-09-26	Changes to conform only with T1 product.	David Vonasek
1.2	2013-01-25	Fixed missing 1-hour,24-hour min/max temperature description in M-Bus telegram	David Vonasek
1.3	2013-06-12	Added Appendix A	Peter King/Ericha Bloom

11.1 Document software and hardware appliance

Type	Version	Date	Comments
Hardware	R1A	2012-09-26	
Software	1.0.0	2012-09-26	

12 References

12.1 References

[1] EN-13757-1, EN-13757-2, EN-13757-3, EN-13757-4 (PR 2011)
Communication System for meters and remote reading of meters, Part1, Part2, Part3, Part 4

[2] Open Metering System Specification – Volume 2 – Primary Communication, Issue 3.0.1/2011-01-29

12.2 Terms and abbreviations

Abbreviation	Description
Product, Device, M-Bus slave	In this document, CMa10w/CMa11w
DIF	Data Information Field (M-Bus data clock information)
VIF	Value Information Field (M-Bus value block information)

12.2.1 Number representation

Decimal numbers are represented as normal number, i.e. 10 (ten).

Hexadecimal numbers are represented with prefix 0x, i.e. 0x0A (ten)

Binary numbers are represented with prefix 0b, i.e. 0b00001010 (ten)

13 Appendix A – Example

13.1 Denomination of values in reports

Denomination	Description
serial-number	M-Bus master id
device-identification	M-Bus slave id
Created	Time stamp
value-data-count	Index at multiple telegram. Usually 0.
manufacturer	Manufacturer
version	Hardware version
device-type	M-Bus slave device type
access-number	Number of times the meter has been read
status	Status
signature	Reserved for future use
fabrication-no,,inst-value,0,0,0	Id for the wireless M-Bus master CMeX50
act-duration,minute(s),inst-value,0,0,0	The values age in minutes
rf-level,dbm,inst-value,0,0,0	Signal strength in dBm
ext-temp,°c,inst-value,0,0,0	Temperature, momentary value
ext-temp,°c,inst-value,0,0,1	Temperature, 1-hour rolling average
ext-temp,°c,inst-value,0,0,2	Temperature, 24-hour rolling average
ext-temp,°c,min-value,0,0,0	Temperature, lowest value during last 1-hour period
ext-temp,°c,max-value,0,0,0	Temperature, highest value during last 1-hour period
ext-temp,°c,min-value,0,0,1	Temperature, lowest value during last 24-hour period
ext-temp,°c,max-value,0,0,1	Temperature, highest value during last 24-hour period
relative-humidity,%,inst-value,0,0,0	Humidity, momentary value
relative-humidity,%,inst-value,0,0,1	Humidity, 1-hour rolling average
relative-humidity,%,inst-value,0,0,2	Humidity, 24-hour rolling average
relative-humidity,%,min-value,0,0,0	Humidity, lowest value during last 24-hour period
relative-humidity,%,max-value,0,0,0	Humidity, highest value during last 24-hour period
relative-humidity,%,min-value,0,0,1	Humidity, lowest value during last 24-hour period
relative-humidity,%,max-value,0,0,1	Humidity, highest value during last 24-hour period
digital-input,,inst-value,0,0,0	Product status

Denomination	Description
other-sw-version,,inst-value,0,0,0	Software version
manufacturer-specific,,inst-value,0,0,0	

13.2 Denomination of values for use in filters

Denomination	Description
mbus.dib.fabrication-no.0.0.0.0	Id for the wireless M-Bus master CMeX50
mbus.dib.act-duration,minute(s).0.0.0.0	The values age in minutes
mbus.dib.rf-level.0.0.0.0	Signal strength in dBm
mbus.dib.ext-temp.0.0.0.0	Temperature, momentary value
mbus.dib.ext-temp.0.1.0.0	Temperature, 1-hour rolling average
mbus.dib.ext-temp.0.2.0.0	Temperature, 24-hour rolling average
mbus.dib.ext-temp.0.0.0.2	Temperature, lowest value during last 1-hour period
mbus.dib.ext-temp.0.0.0.1	Temperature, highest value during last 1-hour period
mbus.dib.ext-temp.0.1.0.2	Temperature, lowest value during last 24-hour period
mbus.dib.ext-temp.0.1.0.1	Temperature, highest value during last 24-hour period
mbus.dib.relative-humidity.0.0.0.0	Humidity, momentary value
mbus.dib.relative-humidity.0.1.0.0	Humidity, 1-hour rolling average
mbus.dib.relative-humidity.0.2.0.0	Humidity, 24-hour rolling average
mbus.dib.relative-humidity.0.0.0.2	Humidity, lowest value during last 24-hour period
mbus.dib.relative-humidity.0.0.0.1	Humidity, highest value during last 24-hour period
mbus.dib.relative-humidity.0.1.0.2	Humidity, lowest value during last 24-hour period
mbus.dib.relative-humidity.0.1.0.1	Humidity, highest value during last 24-hour period
mbus.dib.digital-input.0.0.0.0	Product status